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ANNUAL REPORT

TO THE

PRESIDENT'S FOREIGN INTELLIGENCE ADVISORY BOARD

September 1969
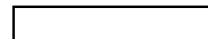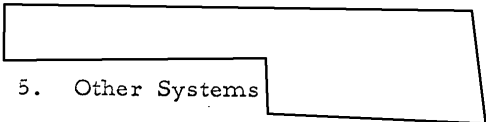
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E. Technical Collection

    1. Imagery*

        a. Collection by Manned Aircraft. The OXCART program
was terminated effective 30 June 1968. The remaining Agency program
for manned aircraft reconnaissance is the U-2 program. This program
(IDEALIST) is maintained in an operationally ready status capable of accom-
plishing assigned missions to conduct covert reconnaissance (photographic and
electronic) over denied territory. Three U-2C/G aircraft and six of the
improved models, the U-2R series, are assigned to the IDEALIST
program.

                                                    However, no flights have
been made over the mainland of China since May 1968 because of policy
restrictions. Since attainment of operational readiness with the U-2R,
two of the U-2C/G models have been placed in flyable storage to be used
as reserve replacements for the U-2R aircraft.

*During 1968 and through July (or Aug) 1969
we have flown 14 photo/elint missions
along the china coast but no closer than
20 nm to the mainland.

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E. Scientific/Technological

    This activity involves research and analysis on foreign scientific

and technical developments, utilizing data from all relevant collection sources.

The basic mission of this activity is that of guarding against technological

surprise and providing as much lead time as possible to those who plan U.S.

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military systems and countermeasures. Since the lead times involved in establishing our own advanced weapons systems are often ten or more years, this intelligence role is a particularly vital one.

Antiballistic Missiles and Air Defense. The Soviet ABM problem continued to command the attention of policy officials as well as large numbers of Agency analytical resources. We have followed ABM and related developments very closely and our production covered such topics as activities at Sary Shagan, ABM-related radars, radar performance in a nuclear blast, characteristics of the Galosh missile, and numerous other reports and monographs on all aspects of ABM research, testing, production and deployment.

Nuclear Energy. Of particular interest are the following two reports: (a) an assessment of the likely characteristics, kill mechanisms, and nuclear weapon effects of nuclear warheads for the Galosh ABM; and (b) an evaluation of the status of nuclear warheads for the SA-2 missile. Also, a recent assessment of the capabilities of intelligence to identify low magnitude seismic events in the USSR will be very useful in U.S. consideration of possible thresholds for comprehensive test ban treaties.

Naval Systems. Studies were conducted of Soviet developments in submarines, nuclear power plants, and antisubmarine warfare, with special attention to precision navigation systems for missile submarines and acoustic homing torpedoes.

Missiles and Space. In addition to analyzing and reporting on all Soviet and Chinese missile and space activity, heavy demands were placed on the Agency for reporting on all aspects of the SS-9 missile system.

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For the long run, the intelligence interest in military technology is not likely to abate, even under arms control of some form. For example, a restriction on the deployment of new missile silos would increase the military value of existing sites and possibly would accelerate the race to improve ratios of yield to weight, accuracy, and reliability of missiles and warheads. The need to guard against technological and military surprise will continue. Accordingly, new collection systems will continue to be developed, and they are likely to result eventually in increased data flows requiring more resources for reporting, analysis, and evaluation.

IV. INFORMATION PROCESSING AND EXPLOITATION

The Information Processing and Exploitation (IP&E) program includes the interpretation and read-out of overhead photography, the dissemination of cables and intelligence documents, central reference services of positive and counterintelligence interest, and automatic data processing (ADP) services. These processes support clandestine operations, collection programs, intelligence analysis and production, and the administrative record keeping and management functions of the Agency.

As mentioned previously, the USIB has approved requirements for the development of a near-real-time imagery satellite system. While it may be too early to assess the total impact of this new system on the Agency, there is no question that it will have a major impact on Agency intelligence processing and production activities. Imagery in great volume will be received in a new form (electrical), requiring new processing concepts, procedures, and equipment. In addition, data will be received on a near-real-time basis, generating requirements for immediate processing, probably around-the-clock staffing, and new analytical techniques. The effect of this system on the way we go about our business is the subject of intensive review and will require a high level of attention for some years to come.

The past five years have seen an unprecedented growth in the Agency's automatic data processing facilities. We believe the rate of growth will not be as great in the future and are looking to qualitative improvements to enable us to keep pace with the ever-growing workload. The following factors bear on this projection.

1. <u>More Efficient Hardware.</u> This Agency has moved rapidly to 3rd generation computers which offer, among other advantages, much more flexibility and capability for the costs involved.

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2. <u>Smoother Technological Transitions</u>. The period of severe dislocation in procedures, software, and skills identified with the shift to 3rd generation computing is now abating.

3. <u>More Productive Utilization of ADP Equipment</u>. The lessening of technological dislocation, referred to above, will increase the percentage of computer time which is available for useful production.

4. <u>Better Skills</u>. Our ADP staffs have grown rapidly in size. The burden of training our ADP technicians has been very great, but we believe we are now over the hump; we now have the skill base on which to build.

5. <u>Better Programming Languages and Systems</u>. The Agency has made considerable progress in converting to easier-to-use and more productive programming languages and general purpose systems. The dividends from such advances will increase over the planning period.

6. <u>ADP Equipment Purchases</u>. Major ADP equipment purchases are planned for FY 1970. When these purchases are complete, the Agency will own the preponderance of its computers (central processing units and immediately related gear).

7. <u>Improved Managerial Coordination</u>. CIA has, in the past, made considerable progress in consolidating ADP activities. We are now moving toward more extensive managerial coordination of the Agency's ADP operations.

D. ADP Services

The major classes of computer applications handled by Agency ADP units are: (1) scientific data processing -- trajectory and orbital analysis, signal analysis, resolution of mathematical formulae, simulation tasks, etc.; (2) intelligence file manipulation -- processing and exploitation of data relating to such substantive areas as foreign missile and space activities, ship movements, Soviet production indices, etc.; (3) document storage and retrieval -- file management systems for building, maintaining and using computer files supporting intelligence activities; and (4) management and administrative data processing -- including payroll, personnel, stock inventory, and financial record keeping for the Agency. These applications are discussed in more detail under the program areas being supported by the ADP application.

The emphasis being given to our ADP Services program is over-whelmingly in the direction of furnishing the user with more direct and effective computer support. Time-sharing computer services will be increased substantially to enable the user, in his own area, to have access to a large central computer and data bases. These on-line systems will enable the user to interact directly with the computer in order to manipulate and exploit data pertinent to his intelligence production, operations, scientific, or even management activities.

VII. RESEARCH, DEVELOPMENT, AND ENGINEERING

The effectiveness of the Agency and the intelligence community will increasingly depend upon well-planned and executed Research, Development, and Engineering (RD&E) to adapt and exploit U.S. and foreign technology to the needs of intelligence collection, processing, and production. Innovation and creativity, supported by adequate exploratory experimentation, will be required to respond to these needs.

In looking to the future several factors will strongly affect our RD&E planning -- however, these factors include both opportunities and problems. Scientific and technological advances continue to provide new capabilities through which access may be achieved to hitherto inaccessible sources of intelligence data of high value. These same technological advances, however, generate improvements in the countermeasures capabilities of the opposition. Our RD&E program, therefore, must emphasize improvements in both positive collection as well as countermeasures capabilities.

More specifically, the following are major highlights or observable trends in our RD&E program for the next year or so: (a) increased emphasis will be given to R&D related to intelligence production/processing activities, particularly to the processing and analysis of photography and electronic signals,

R&D will be initiated to explore processing and production techniques for the near-real-time imagery satellite system.

A. Collection Systems R&D

The Agency's RD&E program reflects the continuing emphasis being given to technical means of collecting information on all aspects of Soviet and Communist Chinese activities and plans. Our effort is concentrated on providing technical support to clandestine agent operations

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B. Information Processing R&D

Research and development in this area is directed at developing

techniques to deal effectively with the increasing amounts of photographic,

electronic, and textual data coming into the Agency, and at developing more

sophisticated techniques for storing, manipulating, and displaying raw

intelligence in order to extract maximum possible finished intelligence. The

importance attached to this problem by Agency intelligence production managers

is reflected in the substantial increases in resources allocated during the

past few years. The trend is expected to continue for several years to come.

Specific projects include: (a) development of automatic target recognition

techniques; (b) automatic storage and retrieval of photographic chips and

accelerated retrieval of textual information, (c) automatically processing and

analyzing large amounts of signal data

(d) techniques for dealing with degraded imagery and improving the imagery

interpretation process (e.g., an automatic stereo comparator is now in final

fabrication); (e) techniques for handling the product of the near-real-time

imagery system; and (f) experimentation with a "satellite" computer system which

may provide the genesis of a general Agency approach to solving computer

usage problems.

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